

In the Claims

1-44 (cancelled)

45. **(new)** A method of curing a composition comprising applying the composition to a three-dimensional substrate and curing by plasma in a plasma discharge chamber wherein the composition comprises (d) and either (a), (b), (c), a mixture of (a) and (b), or a mixture of (a) and (c), wherein

(a) is at least one free-radical-polymerisable compound,

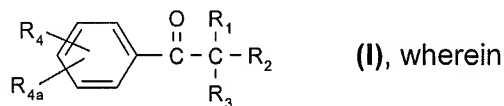
(b) is at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction,

(c) is at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction,

and

(d) is at least one photolabile compound that is activatable by plasma discharge selected from the group consisting of formula I, II and IV;

formula I being

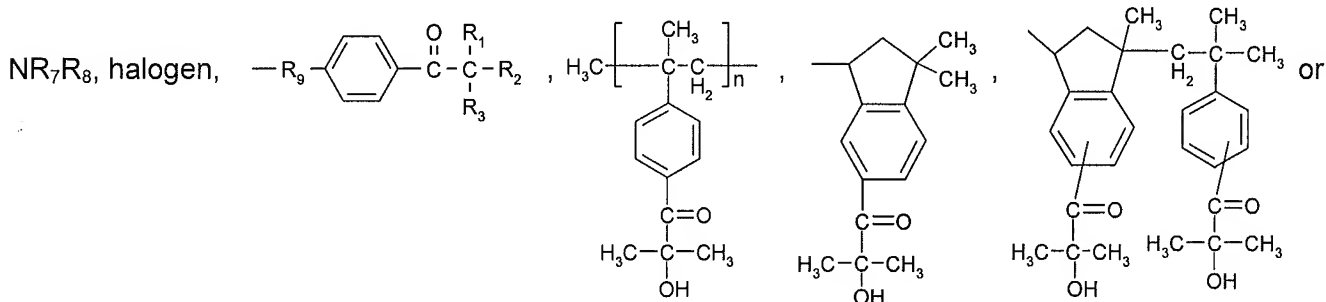


R₁ is C₁-C₁₂alkyl or C₁-C₁₂alkoxy;

R₂ is OR₅ or NR₇R₈;

R₃ is C₁-C₁₂alkyl, C₁-C₁₂alkoxy, C₃-C₁₂alkenyl, phenyl-C₁-C₆alkyl or C₁-C₆alkylphenyl-C₁-C₆alkyl; or R₁ and R₃, together with the carbon atom to which they are bonded, form a cyclohexyl ring;

R₄ and **R_{4a}** are each independently of the other hydrogen, C₁-C₁₂alkyl, C₁-C₁₂hydroxyalkyl, OR₅, SR₆,



a monovalent linear or branched siloxane radical;

n is a number from 1 to 10;

R₅ and **R₆** are each independently of the other hydrogen, C₁-C₁₂alkyl, C₁-C₁₂alkenyl, phenyl, benzyl, Si(CH₃)₃ or $-\text{[C}_a\text{H}_{2a}\text{X]}_b\text{-R}_{10}$;

R₇ and **R₈** are each independently of the other hydrogen, C₁-C₁₂alkyl, C₂-C₅hydroxyalkyl, or **R₇** and **R₈**, together with the N atom to which they are bonded, form a 5- or 6-membered ring, which ring is either not further interrupted or is interrupted by one or more O atoms or a NR₁₁ group;

R₉ is a single bond, O, S, NR₁₁, -CH₂CH₂- or $\begin{array}{c} \text{R}_{12} \\ | \\ \text{---C---} \\ | \\ \text{R}_{13} \end{array}$;

a and **b** are each independently of the other a number from 1 to 12;

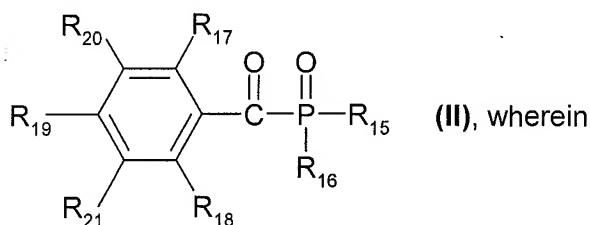
X is S, O or NR₁₁;

R₁₀ is hydrogen, C₁-C₁₂alkyl or $\begin{array}{c} \text{O} \quad \text{R}_{12} \quad \text{R}_{13} \\ || \quad | \quad | \\ \text{---C---C=C---R}_{14} \end{array}$;

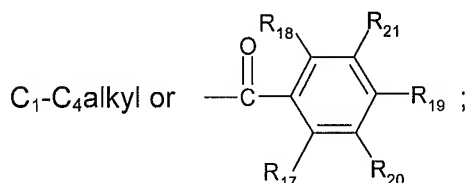
R₁₁ is hydrogen, phenyl, phenyl-C₁-C₄alkyl, C₁-C₁₂alkyl or C₂-C₅hydroxyalkyl; and

R₁₂, **R₁₃** and **R₁₄** are each independently of the others hydrogen or methyl;

formula II being



R₁₅ and **R₁₆** are each independently of the other C₁-C₁₂alkyl, C₁-C₁₂alkoxy, phenyl, phenyl substituted by one or more OR₂₂, SR₂₃, NR₂₄R₂₅, C₁-C₁₂alkyl or halogen substituents, biphenyl, naphthyl, phenyl-



R₁₇ and **R₁₈** are each independently of the other C₁-C₁₂alkyl, C₁-C₁₂alkoxy, CF₃ or halogen;

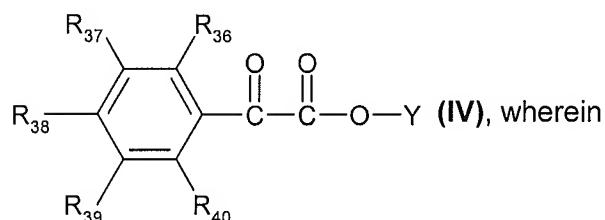
R₁₉, **R₂₀** and **R₂₁** are each independently of the others hydrogen, C₁-C₁₂alkyl, C₁-C₁₂alkoxy, CF₃ or halogen;

R₂₂ and **R₂₃** are each independently of each other hydrogen, C₁-C₁₂alkyl, C₂-C₁₂alkenyl, C₃-C₈cycloalkyl, phenyl, benzyl, C₂-C₂₀alkyl which is interrupted by O atoms or C₂-C₂₀alkyl which is interrupted by O atoms and substituted by OH and/or SH;

R₂₄ and **R₂₅** are each independently of each other hydrogen, C₁-C₁₂alkyl, C₂-C₁₂alkenyl, C₃-C₈cycloalkyl, phenyl, benzyl, C₂-C₂₀alkyl which is interrupted by O atoms, C₂-C₂₀alkyl which is interrupted by O atoms and substituted by OH and/or SH; or **R₂₄** and **R₂₅**, together with the N atom to which they are bonded, form a 5- or 6-membered ring, which ring is uninterrupted or is interrupted by O, S or an NR₂₆ group; and

R₂₆ is hydrogen, phenyl, phenyl-C₁-C₄alkyl, C₁-C₁₂alkoxy, C₁-C₁₂alkyl or C₁-C₁₂hydroxyalkyl;

and formula IV being



R₃₆, **R₃₇**, **R₃₈**, **R₃₉** and **R₄₀** are each independently of the others hydrogen, halogen, OR₄₂, SR₄₃, NR₄₄R₄₅, C₁-C₁₂alkyl, C₁-C₁₂alkyl substituted by OH, C₁-C₄alkoxy, phenyl, naphthyl, halogen, CN and/or -OCOR₄₁, C₂-C₁₂alkyl which is interrupted by one or more O atoms, monovalent linear or branched siloxane radical, phenyl or phenyl substituted by one or two C₁-C₄alkyl and/or one or two C₁-C₄alkoxy substituents;

R₄₁ is C₁-C₈alkyl, phenyl or phenyl substituted by from one to three C₁-C₄alkyl and/or one to three C₁-C₄alkoxy substituents;

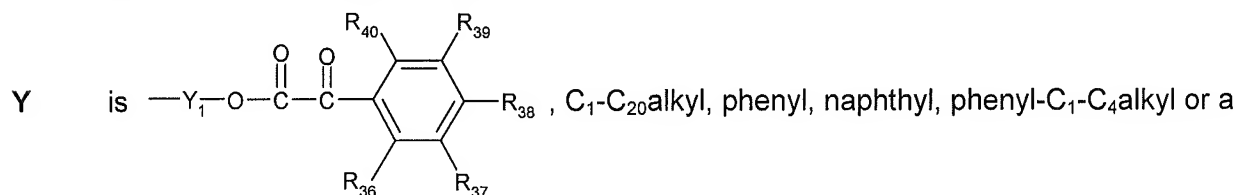
R₄₂ and **R₄₃** are each independently of the other hydrogen, C₁-C₁₂alkyl, C₁-C₁₂alkyl substituted by OH, C₁-C₄alkoxy, phenyl, phenoxy and/or -OCOR₄₁, C₂-C₁₂alkyl which is interrupted by one or more O atoms, C₃-C₆alkenyl, cyclopentyl, cyclohexyl, naphthyl, phenyl or phenyl substituted by C₁-C₄alkoxy, phenyl and/or C₁-C₄alkyl;

R₄₄ and **R₄₅** are each independently of the other hydrogen, C₁-C₁₂alkyl, C₁-C₁₂alkyl substituted by OH, C₁-C₄alkoxy and/or phenyl, C₂-C₁₂alkyl which is interrupted by one or more O atoms, phenyl, -COR₄₁, or SO₂R₄₆, or **R₄₄** and **R₄₅**, together with the nitrogen atom to which they are bonded, form a 5-, 6- or 7-membered ring, which ring is uninterrupted or interrupted by -O- or -NR₄₇-;

or the substituents OR_{42} , SR_{43} , and $NR_{44}R_{45}$ form a 5- or 6-membered by way of the radicals R_{42} , R_{43} , R_{44} and/or R_{45} with further substituents on the phenyl ring or with one of the carbon atoms of the phenyl ring;

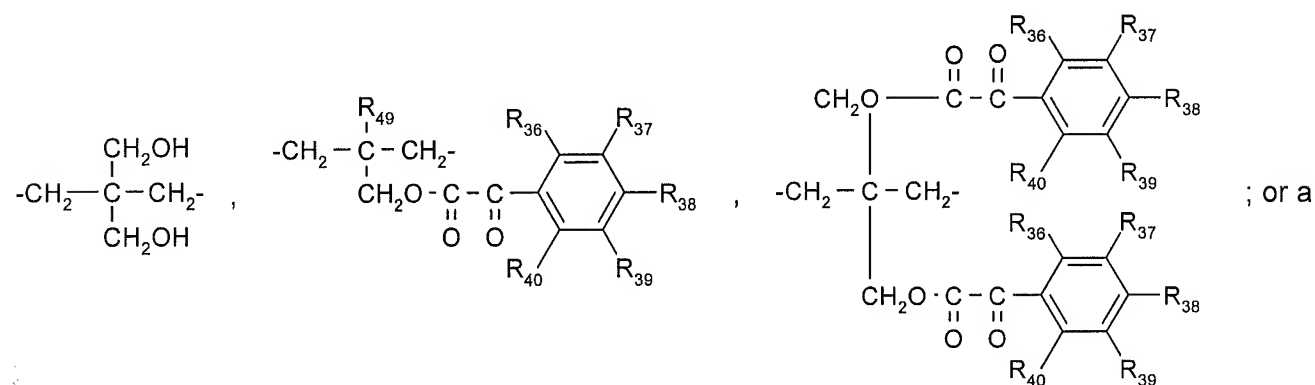
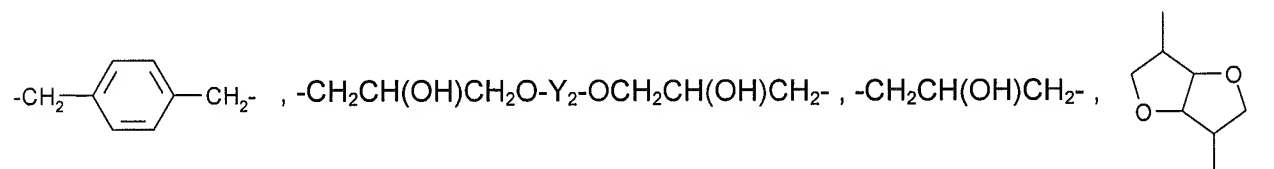
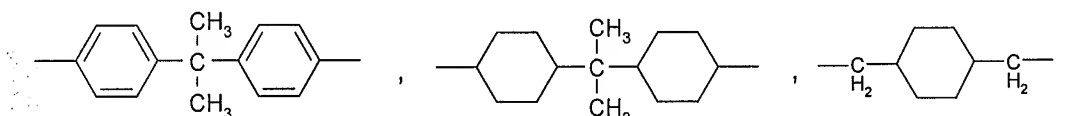
R_{46} is C_1 - C_{12} alkyl, phenyl or 4-methylphenyl;

R_{47} is hydrogen, C_1 - C_8 alkyl, C_1 - C_8 alkyl substituted by OH or C_1 - C_4 alkoxy, phenyl or phenyl substituted by OH, C_1 - C_4 alkyl or C_1 - C_4 alkoxy;



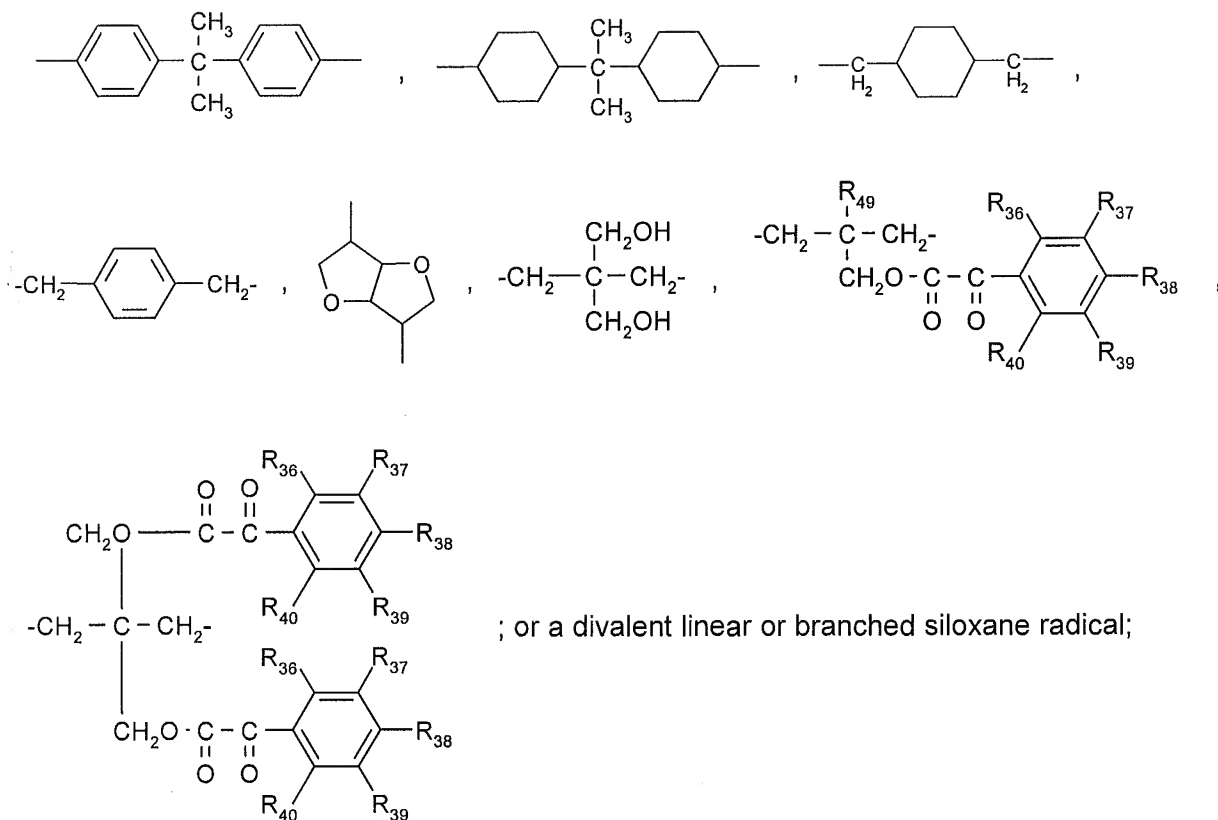
monovalent linear or branched siloxane radical;

Y_1 is phenylene, C_1 - C_{12} alkylene, C_4 - C_8 alkenylene, C_4 - C_8 alkynylene, cyclohexylene, C_4 - C_{40} alkylene interrupted by one or more -O-, -S- or - NR_{48} -, a group



divalent linear or branched siloxane radical;

Y_2 is phenylene, C_1 - C_{12} alkylene, C_4 - C_8 alkenylene, C_4 - C_8 alkynylene, cyclohexylene, C_4 - C_{40} alkylene interrupted by one or more -O-, -S- or - NR_{48} -, a group



; or a divalent linear or branched siloxane radical;

R₄₈ is hydrogen, C₁-C₁₂alkyl or phenyl; and

R₄₉ is hydrogen, CH₂OH or C₁-C₄alkyl.

46. **(new)** A method according to claim 45, wherein component (d) in the composition is at least one compound selected from the group consisting of formula I and II.

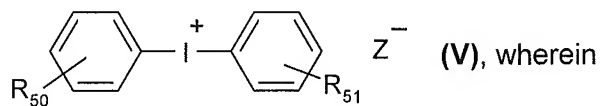
47. **(new)** A method of curing a composition comprising applying the composition to a three-dimensional substrate and curing by plasma in a plasma discharge chamber wherein the composition comprises (d) and either (a), (b), (c), a mixture of (a) and (b), or a mixture of (a) and (c), wherein

- (a) is at least one free-radical-polymerisable compound,
- (b) is at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction,
- (c) is at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction,

and

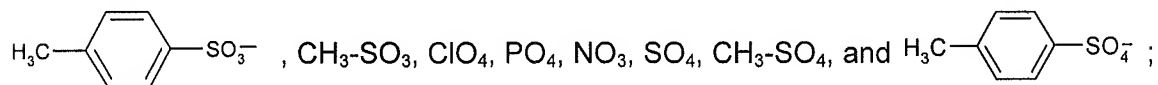
(d) is at least one photolabile compound that is activatable by plasma discharge selected from the group consisting of formula V, VI, VII and VIIa,

formula V being

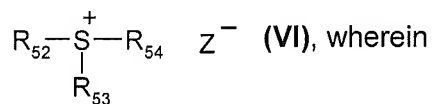


R_{50} and R_{51} are each independently of the other hydrogen, $\text{C}_1\text{-C}_{20}$ alkyl, $\text{C}_1\text{-C}_{20}$ alkoxy, OH-substituted $\text{C}_1\text{-C}_{20}$ alkoxy, halogen, $\text{C}_2\text{-C}_{12}$ alkenyl, cycloalkyl; and

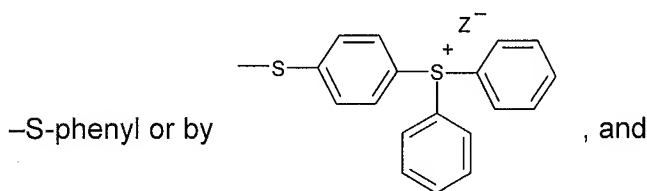
Z^- is an anion selected from PF_6^- , SbF_6^- , AsF_6^- , BF_4^- , $(\text{C}_6\text{F}_5)_4\text{B}^-$, Cl^- , Br^- , HSO_4^- , $\text{CF}_3\text{-SO}_3^-$, F-SO_3^- ,



formula VI being

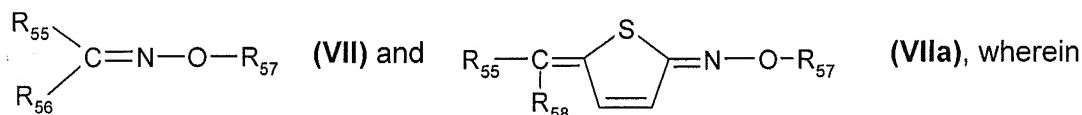


R_{52} , R_{53} and R_{54} are each independently of the others unsubstituted phenyl, or phenyl substituted by



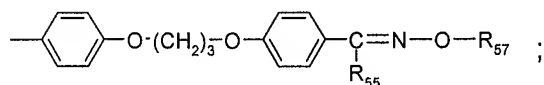
Z^- is as defined above;

formula VII and formula VIIa being



R_{55} is $\left[\text{C} \begin{array}{c} \text{O} \\ \parallel \\ \text{---} \end{array} \right]_q R_{58}$, (CO)O-C₁-C₄alkyl, CN or C₁-C₁₂haloalkyl;

R_{56} is $\left[\text{C} \begin{array}{c} \text{O} \\ \parallel \\ \text{---} \end{array} \right]_q R_{58}$, (CO)O-C₁-C₄alkyl, CN, C₁-C₁₂haloalkyl or



R_{57} is C₁-C₁₆alkylsulfonyl, C₁-C₁₀haloalkylsulfonyl, camphorylsulfonyl, phenyl-C₁-C₃alkylsulfonyl, C₃-C₃₀cycloalkylsulfonyl, phenylsulfonyl, naphthylsulfonyl, anthracylsulfonyl or phenanthrylsulfonyl, unsubstituted or substituted by one or more halogen, C₁-C₄haloalkyl, CN, NO₂, C₁-C₁₆alkyl, phenyl, C₁-C₄alkylthio, C₁-C₄alkoxy, phenoxy, C₁-C₄alkyl-O(CO)-, C₁-C₄alkyl-(CO)O-, R₆₇OSO₂- and/or

-NR₆₀R₆₁ substituents; C₂-C₆haloalkanoyl, halobenzoyl, $\begin{array}{c} \text{X}_1 \\ \parallel \\ \text{---P---} R_{64} \\ | \\ R_{63} \end{array}$, $\begin{array}{c} \text{X}_1 \\ \parallel \\ \text{---P---} R_{64} \\ | \\ \text{X}_2 \text{---} R_{65} \end{array}$ or $\begin{array}{c} \text{X}_1 \\ \parallel \\ \text{---P---} \text{X}_3 \text{---} R_{66} \\ | \\ \text{X}_2 \text{---} R_{65} \end{array}$;

X_1 , X_2 and X_3 are each independently of the others O or S;

q is 0 or 2;

R_{58} is C₁-C₁₂alkyl, cyclohexyl, camphoryl, unsubstituted phenyl, or phenyl substituted by one or more halogen, C₁-C₁₂alkyl, OR₅₉, SR₅₉ or NR₆₀R₆₁ substituents;

R_{59} is C₁-C₁₂alkyl, phenyl, phenyl-C₁-C₄alkyl or C₁-C₁₂hydroxyalkyl;

R_{60} and R_{61} are each independently of the other hydrogen, C₁-C₄alkyl, C₂-C₆hydroxyalkyl, or R_{60} and R_{61} , together with the N atom to which they are bonded, form a 5- or 6-membered ring, which ring is uninterrupted or interrupted by O or an NR₆₂ group;

R_{62} is hydrogen, phenyl, phenyl-C₁-C₄alkyl, C₁-C₁₂alkyl or C₂-C₅hydroxyalkyl;

R_{63} , R_{64} , R_{65} and R_{66} are each independently of the others C₁-C₆alkyl, C₁-C₆haloalkyl, phenyl or phenyl substituted by C₁-C₄alkyl or halogen; and

R_{67} is hydrogen, C₁-C₄alkyl, phenyl or tolyl.

48. (new) The method according to claim 45, wherein the composition comprises, in addition to the photolabile component (d), other additives (h), sensitizer compounds (f) and/or dyes or pigments (g).

49. **(new)** The method according to claim 48, wherein the composition comprises at least one light stabiliser or/and at least one UV absorber compound.

50. **(new)** The method according to claim 45, wherein the composition is a surface coating.

51. **(new)** The method according to claim 45, wherein the composition is a printing ink.

52. **(new)** The method according to claim 45, wherein the composition comprises as polymerisable component solely free-radical-polymerisable compounds (a).

53. **(new)** The method according to claim 52, wherein the free-radical-polymerisable compound comprises at least one compound selected from the group consisting of mono-, di-, tri- or tetra-functional acrylate monomers and mono-, di-, tri- or tetra-functional acrylate-functional oligomers.

54. **(new)** The method according to claim 45, wherein the composition comprises as polymerisable component solely cationically polymerisable or crosslinkable compounds (b).

55. **(new)** The method according to claim 45, wherein the composition comprises as polymerisable component a mixture of at least one free-radical-polymerisable compound (a) and at least one cationically polymerisable compound (b).

56. **(new)** The coated substrate which is coated on at least one surface by means of the method according to claim 54.

57. **(new)** A coating obtained by a method according to claim 45.

58. **(new)** A method of curing a composition wherein the composition comprises

(1) a combination of at least one electron acceptor maleimide compound and at least one electron donor vinyl ether compound; and

(2) optionally at least one free-radical-polymerisable compound (a),
wherein the curing is carried out in a plasma discharge chamber.

59. **(new)** The method according to claim 45 of curing a composition wherein the composition comprises (a), (d) and either (a1), (a2) or a mixture of (a1) and (a2) wherein (a) is at least one free-radical-polymerisable component having at least one ethylenically unsaturated double bond, the free-radical-polymerisable component optionally additionally being functionalised with OH, NH₂, COOH, epoxy or NCO groups; (a1) is a mixture of at least one compound selected from the group consisting of polyacrylates and polyester polyols, and at least one compound selected from the group consisting of melamine, melamine derivatives and blocked or non-blocked polyisocyanates; (a2) is a mixture of at least one compound selected from the group consisting of carboxyl-, anhydride- or amino-functional polyesters and carboxyl-, anhydride- or amino-functional polyacrylates, and at least one compound selected from the group consisting of epoxy-functional polyesters and polyacrylates; and (d) is at least one photolatent compound of that is activatable by plasma discharge selected from the group consisting of formula I, II, and IV; wherein the curing of the composition is carried out in a plasma discharge chamber and, optionally, thermal pre- or after-treatment is carried out.

60. **(new)** The method of curing a composition according to claim 45 for producing mouldings from composite materials, wherein a support is impregnated with the composition and introduced into a mould; wherein the curing is carried out in a plasma discharge chamber and, optionally, thermal aftertreatment is carried out.

61. **(new)** The method according to claim 47, wherein the composition comprises, in addition at least one light stabiliser and/or at least one UV absorber compound and optionally other additives (h), sensitiser compounds (f) or dyes or pigments (g).

62. **(new)** The method according to claim 47, wherein the composition is a surface coating.

63. **(new)** The method according to claim 47, wherein the composition comprises as polymerisable component solely cationically polymerisable or crosslinkable compounds (b).

64. **(new)** The method according to claim 47, wherein the composition comprises as polymerisable component a mixture of at least one free-radical-polymerisable compound (a) and at least one cationically polymerisable compound (b).

65. **(new)** The method according to claim 47 of curing a composition wherein the composition comprises (a), (d) and either (a1), (a2) or a mixture of (a1) and (a2) wherein

(a) is at least one free-radical-polymerisable component having at least one ethylenically unsaturated double bond, the free-radical-polymerisable component optionally additionally being functionalised with OH, NH₂, COOH, epoxy or NCO groups; and

(a1) is a mixture of at least one compound selected from the group consisting of polyacrylates and polyester polyols, and at least one compound selected from the group consisting of melamine, melamine derivatives and blocked or non-blocked polyisocyanates;

(a2) is a mixture of at least one compound selected from the group consisting of carboxyl-, anhydride- or amino-functional polyesters and carboxyl-, anhydride- or amino-functional polyacrylates, and at least one compound selected from the group consisting of epoxy-functional polyesters and polyacrylates;

and

(d) is at least one photolabile compound of that is activatable by plasma discharge selected from the group consisting of formula V, VI, VII and VIIa;

wherein

the curing of the composition is carried out in a plasma discharge chamber and, optionally, thermal pre- or after-treatment is carried out.

66. **(new)** The method of curing a composition according to claim 47 for producing mouldings from composite materials, wherein a support is impregnated with the composition and introduced into a mould; wherein the curing is carried out in a plasma discharge chamber and, optionally, thermal aftertreatment is carried out.

67. **(previously presented)** A method of curing a composition according to claim 45 wherein (d) comprises at least one compound of formula I and one compound of formula II.